REMARKS

Applicant respectfully requests reconsideration in view of the amendment and following remarks. Support for newly added claims 32-34 can be found in the specification at page 2, lines 8-18. The applicant authorizes the PTO to charge Deposit Account No. 03-2775, under Order No. 05129-00053-US, $50.00 for the extra claim over 20.

Claims 28, 30 and 31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 14-20 and 22-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Smith et al. U.S. Patent No. 5,276,063 ("Smith"). Claims 24-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 96/34038 to Shmidt et al.("Shmidt") The applicant respectfully traverses these rejections.

35 U.S.C. 112, Second Paragraph Rejection

Claims 28, 30 and 31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner stated that a temperature range was necessary for these claims. The applicant respectfully disagrees. It is not the temperature that is being determined but it is the thermal conductivity that it being determined. The thermal conductivity is determined at a fixed temperature (at 10°C) for a specific duration (after 90 days storage at room temperature). The thermal conductivity at this specific temperature and duration is **27.0 mW/m.K or less** (see claim 28). For the above reasons, these claims are clearly defined and this rejection should be withdrawn.

Rejections Over Smith

Claims 14-20 and 22-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Smith. Claims 24-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith. Smith does not teach the use of 1,1,1,2-tetrafluoroethane ("HFC 134a") as required by the applicant's claimed invention.

It is recognized that Smith discloses HFC-134a among a long list of blowing agents at col. 3, line 28 through col. 4, line 6:

> The blowing agent may further comprise small amounts (less than 15 weight percent) of a **tertiary blowing agent** comprising other known blowing agents including inorganic agents, organic blowing agents other than those mentioned above, and chemical blowing agents. Suitable inorganic blowing agents include (1) carbon dioxide, (2) nitrogen, (3) argon, (4) water, (5) air, and (6) helium. Organic blowing agents include aliphatic hydrocarbons having 1-9 carbon atoms and fully and partially halogenated aliphatic hydrocarbons having 1-4 carbon atoms. Aliphatic hydrocarbons include (7) methane, (8) ethane, (9) propane, (10) n-butane, (11) isobutane, (12) n-pentane, (13) isopentane, (14) neopentane, and the like. Fully and partially halogenated aliphatic hydrocarbons include fluorocarbons, chlorocarbons, and chlorofluorocarbons. Examples of fluorocarbons include (15) methyl fluoride, (16) perfluoromethane, (17) difluoromethane (HFC-32), (18) ethyl fluoride, (19) 1,1,1-trifluoroethane (HFC-143a), (20) **1,1,1,2-tetrafluoro-ethane (HFC-134a)**, (21) pentafluoroethane, (22) perfluoroethane, (23) 2,2-difluoropropane, (24) 1,1,1-trifluoropropane, (25) perfluoropropane, (26) perfluorobutane, (27) perfluorocyclobutane. Partially halogenated chlorocarbons and chlorofluorocarbons for use in this invention include (28) methyl chloride, (29) methylene chloride, (30) 1,1,1-trichloroethane, (31) 1,1-dichloro-1-fluoroethane (HCFC-141b), (32) 1-chloro-1,1-difluoroethane (HCFC-142b), (33) 1,1-dichloro-2,2,2-trifluoroethane (HCFC-123) and (34) 1-chloro-1,2,2,2-tetrafluoroethane (HCFC-124). Fully halogenated chlorofluorocarbons include (35) trichloromonofluoromethane (CFC-11), (36) dichlorodifluoromethane (CFC-12), (37) trichlorotrifluoroethane (CFC-113), (38) dichlorotetrafluoroethane (CFC-114), (39) chloroheptafluoropropane, and (40) dichlorohexafluoropropane. Chemical blowing agents include (41) azodicarbonamide, (42) azodiisobutyro-nitrile, (43) benzenesulfonhydrazide, (44) 4,4-oxybenzene sulfonyl-semicarbazide, (45) p-toluene sulfonyl semi-carbazide, (46) barium

azodicarboxylate, (47) N,N'-dimethyl-N,N'-dinitrosoterephthalamide, and (48) trihydrazino triazine.[1] (emphasis added)

HFC-134a is only one out of the 48 specifically disclosed as one of the tertiary blowing agents. None of the examples in Smith disclose the use of HFC-134a.

Smith further states at col. 4, lines

> **A surprising feature of this invention is that it is possible to blow a closed-cell, alkenyl aromatic polymer foam structure using HFC-152a** as the primary blowing agent. The use is surprising in view of its relatively low solubility in alkenyl aromatic polymers, such as polystyrene, and its relatively high vapor pressure. Typically, the ability of a blowing agent to produce a foam structure with relatively large cells has been observed to decrease as its solubility in the polymer decreases and as its vapor pressure increases. **Thus, a blowing agent with relatively low solubility and a relatively high vapor pressure will usually produce a relatively small cell size foam structure. A blowing agent with relatively high solubility and relatively low vapor pressure will usually produce a relatively large cell size foam structure.** The process of the present invention is surprising because it does not follow previous observations. (emphasis added)

Table 1 illustrates solubility and vapor pressure data for several common blowing agents. Therefore, from table 1, it is clear that HFC-134a has even a lower solubility than HFC-152a and a higher vapor pressure than HFC-152a. Again, as stated above,

> **" a blowing agent with relatively low solubility and a relatively high vapor pressure will usually produce a relatively small cell size foam structure. A blowing agent with relatively high solubility and relatively low vapor pressure will usually produce a relatively large cell size foam structure."**

Therefore, it would have been expected that HFC-134a would be even less likely to produce **a relatively large cell size foam structure** than HFC-152a or other blowing agents listed in Table 1. This is further confirmed at col. 4, lines 54-68 of Smith,

[1] The numbers in the brackets were inserted by the applicant.

PAGE 10/14 * RCVD AT 6/27/2005 3:46:27 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/4 * DNIS:8729306 * CSID:302 661 2331 * DURATION (mm-ss):03-34

> Relatively **large cell size alkenyl aromatic polymer foams have been made using HCFC-142b** with or without ethyl chloride. HCFC-142b has **been used successfully in making large cell size foams** because of its **relatively moderate solubility** in alkenyl aromatic polymers and its **relatively moderate vapor pressure**.
>
> Other above-mentioned blowing agents, namely CFC-12, HCFC-22, **HFC-134a, typically have not been successfully employed in making relatively large cell foams due to their relatively low solubility** in alkenyl aromatic polymers and **high vapor pressure**. Given that HFC-152a has similar vapor pressure and solubility in alkenyl aromatic polymers as those blowing agents, it is surprising that a relatively large cell size foam could be produced with it. (emphasis added)

The results for Table 1 also confer that HFC -134a is the worst with respect to solubility. HFC -134a only had a 1.0 solubility. In addition, HFC-134a also had a high vapor pressure (665.4) especially compared to HCFC -142b (337.9). It is interesting to note that the three unsuccessful blowing agents, CFC-12, HCFC-22 and HFC-134a, were the only blowing agents listed in table 1 that had a vapor pressure over 600 (651.3, 1044 and 665.4 respectively). It is also interesting to note that the three unsuccessful blowing agents, CFC-12, HCFC-22 and HFC-134a, were the only blowing agents listed in table 1 that had a solubility less than 1.7 (1.5, 1.6 and 1.0 respectively).

Smith does teach to combine two blowing agents (a secondary with the first blowing agent being HFC-152a). However, it is clear that the secondary blowing agent can NOT be HFC-134a. Smith states at col. 3, lines 9-27:

> The blowing agent further comprises a **secondary blowing agent** present from between about 10 to less than 50 weight percent and preferably from about 20 to about 40 weight percent based upon the total weight of the blowing agent. The secondary blowing agent **will have a lower vapor pressure in air at 25.degree. C. than HFC-152a**. The secondary blowing agent **will further be more soluble in the alkenyl**

PAGE 11/14 * RCVD AT 6/27/2005 3:46:27 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/4 * DNIS:8729306 * CSID:302 661 2331 * DURATION (mm-ss):03-34

> **aromatic polymer than HFC-152a**. The secondary blowing agent will preferably have a vapor pressure in air at 25^0 C. of less than 580 kilopascals, and preferably have a solubility in polystyrene (200,000 weight average molecular weight according to size exclusion chromatography) of greater than 1.9 parts per hundred by weight at 25.degree. C. per atmosphere of air pressure based upon the weight of the polymer. **Preferred secondary blowing agents are ethyl chloride, ethanol, acetone, methanol, propanol, dimethyl ether, and ethyl acetate. Ethyl chloride is most preferred**. (emphasis added)

HFC-134a can NOT be the secondary blowing agent since it has a higher vapor pressure than HFC-152a (665.4 vs. 598.5). A second reason, HFC-134a can NOT be the secondary blowing agent is because it has a lower solubility than HFC-152a (1.0 versus 1.8). Clearly, for the reasons stated above, Smith teaches away from using HFC-134a in combination with HFC-152a.

Again, none of the examples use HFC-134a, let alone a combination of HFC-134a and HFC-152a. For the above reasons, these rejections should be withdrawn.

Rejection over Shmidt

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shmidt. Shmidt discloses at page 2,

> "blowing agent of which 70 mole percent or more is selected form the group consisting of **1,1-difluoroethane (HFC-152a)**, 1,1,1-trifluoroethane (HFC-143a), (20) **1,1,1,2-tetrafluoro-ethane (HFC-134a,** chlorodifluoromethane (HCFC-22), **carbon dioxide(CO_2)** and difluoromethane (HFC-32) and mixtures of the foregoing based upon the total number of moles of blowing agent. (emphasis added)

This list of blowing agents is also disclosed at page 3, line 3-13. At page 3, lines 13-32 there is a long list of co-blowing agents. Neither HFC-152a nor HFC-134a appears on that list. None of the 45 runs have a blowing agent with a weight ratio of 1,1-difluoroethane to 1,1,1,2-

tetrafluoroethane in the blowing agent is greater than 1 and contain also carbon dioxide as is required by claim 21.

The Examiner must consider the reference as a whole, In re Yates, 211 USPQ 1149 (CCPA 1981). The Examiner cannot selectively pick and choose from the disclosed multitude of parameters **without any direction** as to the particular one selection of the reference **without proper motivation**. The mere fact that the prior art may be modified to reflect features of the claimed invention does not make modification, and hence claimed invention, obvious **unless the prior art suggested the desirability of such modification** (In re Gordon, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984); In re Baird, 29 USPQ 2d 1550 (CAFC 1994) and In re Fritch, 23 USPQ 2nd. 1780 (Fed. Cir. 1992)). In re Gorman, 933 F.2d 982, 987, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991) (in a determination under 35 U.S.C. § 103 it is impermissible to simply engage in a hindsight reconstruction of the claimed invention; the references themselves must provide some teaching whereby the applicant's combination would have been obvious); In re Dow Chemical Co., 837 F.2d 469,473, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988) (under 35 U.S.C. § 103, both the suggestion and the expectation of success must be founded in the prior art, not in the applicant's disclosure). The applicant disagrees with the Examiner why one skilled in the art with the knowledge of the references would selectively modify the reference in order to arrive at the applicant's claimed invention. The Examiner's argument is clearly based on hindsight reconstruction. For the above reason, this rejection should be withdrawn.

In view of the above amendment, applicant believes the pending application is in condition for allowance.

PAGE 13/14 * RCVD AT 6/27/2005 3:46:27 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/4 * DNIS:8729306 * CSID:302 661 2331 * DURATION (mm-ss):03-34

Application No.: 10/070979 Docket No.: 05129-00053-US

A two month extension has been paid. Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 03-2775, under Order No. 05129-00053-US from which the undersigned is authorized to draw.

Respectfully submitted,

By _____

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PAGE 14/14 * RCVD AT 6/27/2005 3:46:27 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-1/4 * DNIS:8729306 * CSID:302 661 2331 * DURATION (mm-ss):03-34